

**ADMINISTRATIVE ORDER ON CONSENT  
SITE INVESTIGATION REPORT ADDENDUM  
GROUNDHOG NO. 5 STOCKPILE  
HANOVER AND WHITEWATER CREEKS  
INVESTIGATION UNIT**

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## 1.0 INTRODUCTION

Golder Associates Inc. (Golder) prepared this Addendum for Freeport McMoRan Chino Mines Company (Chino) to present the results of a supplemental site investigation of the regraded Groundhog No. 5 Stockpile, within the Hanover and Whitewater Creeks Investigation Unit (HWCIU). The purpose of the investigation is to supplement additional data to the November 2004 site investigation original results (Golder, 2005). As stated in the Site Investigation Work Plan (Golder, 2004), the investigation is consistent with a long-term strategy for closure/closeout and standards prescribed in the Administrative Order on Consent (AOC) agreement and the New Mexico Mining Act and Rules.

This Addendum, which presents the results of this investigation, is organized into the following six sections:

- **Section 1 – Introduction** - provides the context of this study and organization of this report.
- **Section 2 – Site Description and Background** - summarizes the history and physical setting of the stockpile.
- **Section 3 – Summary of Supplemental Field Investigation** - discusses the test pit investigation.
- **Section 4 –Results of Field Investigation** – presents the results of the chemical analyses.
- **Section 5 – Summary and Conclusions** – presents the supplemental investigation summary.
- **Section 6 –References** - lists the references used in preparation of this document.

## 2.0 SITE DESCRIPTION AND BACKGROUND

The Groundhog No. 5 Stockpile is a small stockpile (footprint of less than 2 acres) associated with the Groundhog No. 5 Shaft located on the north wall of Lucky Bill Canyon near its confluence with Bayard Canyon. The primary ores at the site consist of lead and zinc sulfides occurring in mineralized veins below the Sugarlump and Kneeling Nun Tuffs that are visible at the surface in the canyon. The tuffs overlie Cretaceous-Tertiary sediments (the Colorado Formation), which in turn overlie a series of Paleozoic limestones and shales. Stockpile material types at the site include limestone, granodiorite, diorite, quartz monzonite, and tuff. Iron staining is minimal and restricted to small, isolated locations in the stockpile associated with finer-grained, mineralized material. The stockpile was regraded in 2006. The current stockpile configuration is shown on Figure 1.

The previous site configuration and details of the November 10, 2004 site investigation were presented in the Site Investigation Report (SIR; Golder, 2005). The previous investigation included three test pits in the stockpile prior to regrading. Test Pits GH5-1 and GH5-2 were excavated to the maximum reach of the trackhoe (20 to 22 feet below ground surface [feet bgs] and Test Pit GH5-3 was excavated to refusal at bedrock (7 feet bgs). The purpose of the 2004 site test-pit investigation was to estimate the lateral and vertical extent of the stockpile material and to characterize the chemical nature of the material with respect to expected environmental behavior and suitability of the stockpile material for vegetation substrate.

Results of the 2004 investigation demonstrated that the stockpile material is non-acid generating, with minor amounts of mineralized materials present. Prior to regrading, the upper layer of the stockpile was composed primarily of angular limestone gravel with minor sulfide mineralization and iron staining. The limestone was generally underlain by unmineralized granodiorite, quartz monzonite stockpile material, and the pre-mining surface (tuff bedrock and colluvium). The acid-base accounting (ABA) results showed that the stockpile materials are not acid generating. Synthetic precipitation leachate procedure (SPLP) results did not yield leachate constituent concentrations (metals or other constituents) above New Mexico surface-water or groundwater standards, with the exception of one exceedance of total dissolved solids (TDS). The TDS exceedance was likely due to laboratory analytical error, as the TDS value could not be reproduced by summing all dissolved ions (Golder, 2004).

Agronomic analysis of the stockpile material demonstrated that the stockpile material would perform adequately as a vegetation substrate. Additional agronomic characterization of the stockpile material

was not performed as part of the 2007 supplemental investigation, as the closure plan includes placement of a soil cover.

No saturated zones were observed in test pits, and no seeps were identified during the 2004 investigation. A shallow groundwater monitoring well (GH-97-04) is located at the toe of the stockpile. This well was installed under the AOC in 1997 to collect samples of shallow groundwater (Daniel B. Stephens and Associates, Inc [DBS&A], 1997). The well was installed using a backhoe to excavate to bedrock and installing horizontal perforated pipe attached to a riser pipe. The DBS&A report includes the following description of the materials encountered during installation of GH-97-04:

*“Overbank alluvium of well-graded poorly sorted fine sands to angular subangular boulders, less than 1 ft in size, slightly moist, no evidence of subsurface water flow, no staining or alteration”*

GH-97-04 was inspected in August and September 1997, before and after rain events (DBS&A, 1997), and was dry. It was dry when inspected in July 2004. On December 15, 2006, during the supplemental field investigation, the well was inspected and contained a small amount of water as indicated by a survey tape lowered into the well. Chino returned to the well on December 21, 2006, to collect a sample, but the well did not produce sufficient water to sample (less than 500 milliliters). Chino has checked the well several times since December 21, 2006, and the well has not recharged.

### **3.0 SUMMARY OF SUPPLEMENTAL FIELD INVESTIGATION**

The supplemental sampling was performed at the New Mexico Environment Department's (NMED's) request to confirm the conclusions and recommendations of the SIR (Golder, 2005). Supplemental samples were collected at five locations (test pit locations GH5-4 through GH5-8, shown on Figure 1). The additional chemical characterization of the stockpile materials included ABA, total metals analysis, paste pH, and SPLP testing of samples collected from the upper 3 feet of the five test pits.

The field investigation was performed jointly by Jen Pepe (Golder), Pam Pinson (Chino), and Phil Harrigan (NMED). Sampling and analysis performed for this supplemental characterization were consistent with the Site Investigation Work Plan (Golder, 2004).

#### **3.1 Test Pit Excavation and Sampling**

Five test pits were excavated in the stockpile during the December 15, 2006 investigation. Two test pit locations were selected on the relatively flat top of the stockpile (GH5-4 and GH5-5) and three locations were selected on the slope (GH5-6, GH5-7 and GH5-8), as shown on Figure 1.

##### **3.1.1 Test Pit Excavation**

The test pits were excavated by James Hamilton Construction Company using a TB035 mini-trackhoe. The stockpile test pits were logged according to the Unified Soil Classification System, with emphasis on documentation of stratification, moisture conditions, secondary mineralization, and lithology of the mine rock. Detailed logs for the stockpile test pits are included in Appendix B. Test pits were excavated to a depth of 3 to 4 feet bgs, except for test pit GH5-5, which was excavated to refusal at 2.5 feet bgs. NMED requested that samples be collected from the upper 3 feet of the test pits.

Following excavation, each pit was backfilled and the location was surveyed using a hand-held Geographical Positioning System.

##### **3.1.2 Test Pit Sampling**

Samples were collected from the pit walls from the ground surface to a depth of up to 3 feet bgs according to Standard Operating Procedure (SOP) 21 – "Sample Collection from Soil Borings, Excavations and Hand Dug Pits" (Chino, et al, 1997). Sample depths were documented on the test pit logs (Appendix B). The thickness of the sampling interval for each test pit was based on visual observations and agreed on by Golder, Chino, and NMED. The sampling interval was 0 to 3 feet bgs for Test Pits GH5-4, GH5-6, and GH5-8. The sampling interval for Test Pit GH5-5 was 0 to 18 inches



bgs, as the material below a depth of 18 inches was mixed with colluvium from the pre-mining ground surface. The sampling interval for Test Pit GH5-7 was 0 to 6 inches bgs, as no soil matrix was present in the test pit below a depth of 6 inches. Material encountered below the 6-inch depth was oversized (greater than 3 inches in diameter).

Samples were packaged and shipped according to SOP 5, "Packaging and Shipping of Environmental Sample Containers" (Chino, et al, 1997). A chain-of-custody (COC) form was completed listing each sample. The COC accompanied the samples to the analytical laboratory.

A quality assurance/quality control (QA/QC) sample was collected during the field investigation as outlined in SOP 3, "Field Quality Control" (Chino, et al, 1997). The QA/QC sample was a Blind Field Duplicate (sample GH5-DUP). The duplicate sample was collected from Test Pit GH5-8 by placing the 0 to 3 feet sample on a clean piece of plastic sheeting and using the cone and quarter method to composite and split the sample. Half of the sample was labeled with the depth interval and the other half was labeled as a duplicate.

### **3.2 Decontamination Procedure**

No reusable equipment was used during sampling; therefore, no equipment decontamination was required. The excavator bucket did not require decontamination because saturated materials were not encountered and the bucket remained free of residual soils between test pits. A blind decontamination rinseate blank was not collected because sampling was conducted using only clean, gloved hands and no other sampling equipment.

## **4.0 RESULTS OF FIELD INVESTIGATION**

This section summarizes the chemical nature of the near-surface stockpile materials in the regraded Groundhog No. 5 Stockpile.

### **4.1 Geologic Descriptions**

Stockpile material types observed on the surface and in test pits were primarily limestone and quartz monzonite, with minor amounts of quartz-sericite-pyrite (QSP) altered granodiorite. Stockpile materials were generally sandy gravels and gravelly sands (Appendix B). The matrix was dry to moist.

The lithology of the stockpile materials in Test Pits GH5-4 and GH5-5, excavated on the stockpile top (Figure 1), was primarily limestone with minor amounts of quartz monzonite. The lithology of the materials in Test Pits GH5-6 and GH5-8 was a mix of limestone, monzonite, and granodiorite with minor amounts of QSP mineralization present. Test Pit GH5-7, excavated in the center of the regraded slope, was primarily gravel- to boulder-sized, recrystallized limestone, with a thin surface layer of sandy gravel that included some quartz monzonite in the sand fraction. Limestone in all test pits was generally unmineralized. All matrices reacted with hydrochloric acid, regardless of the predominant lithology.

Based on the test pit investigation, the materials on the top of the stockpile are generally finer in texture (oversize fraction less than 10 percent in Test Pits GH5-4 and GH5-5) and predominantly angular limestone gravel. The fraction of oversize material and the amount of quartz monzonite gravel is greater on the regraded slope than on the top of the stockpile. This observation is consistent with the previous investigation.

### **4.2 Laboratory Chemical Analysis**

Geochemical characterization included ABA, paste pH, SPLP, and total metals analysis. Analyses were performed by SVL Analytical, Inc., in Kellogg, Idaho, in accordance with the following methods:

- Total Metals Analysis (Digestion Method 3050),
- ABA (Modified Sobek),
- Paste pH (ASA Method 9), and
- SPLP (EPA Method 1312).

Prior to analysis, samples were air-dried and crushed to 3/8-inch minus, according to SPLP Method 1312, in the laboratory. An aliquot of each sample was pulverized to minus 160 mesh (approximately

0.09 millimeter) for ABA (Modified Sobek), paste pH, and total metals analysis (Method 3050). Laboratory data sheets are included in Appendix C.

### 4.3 Results and Geochemical Interpretation

#### 4.3.1 Acid-base Accounting

The ABA results are presented in Table 1. Figures 2 through 7 provide graphical representations of the pertinent results.

In accordance with Price (1997), the following screening criteria were used to classify the samples in terms of their neutralization potential ratio (NPR):

ARD Potential	Screening Criterion	Comments
Likely	Acid-Neutralizing Potential/Acid-Generating Potential (ANP/AGP) < 1	Likely ARD generating unless sulfide minerals are non-reactive
Possibly	$1 < \text{ANP/AGP} < 2$	Possibly ARD generating if NP is insufficiently reactive or is depleted at a rate faster than sulfides
Low	$2 < \text{ANP/AGP} < 4$	Not potentially ARD generating unless sulfides are preferentially exposed or extremely reactive in combination with insufficiently reactive NP
None	$\text{ANP/AGP} > 4$	Not acid generating

Notes:

NPR = ANP/AGP

ARD = acid rock drainage

ANP = acid-neutralization potential

AGP = acid-generating potential

A fifth category follows an empirical rule of thumb. Materials with a pyrite sulfur content less than 0.3 percent and a paste pH greater than 5.5 generally are considered non-acid-generating regardless of their NPR (acid-neutralization potential [ANP]/acid-generation potential [AGP]).

Figure 2 shows ANP values versus AGP values. Also included are the linear expressions of the acid rock drainage (ARD) NPR criteria advocated by Price (1997). Based on this classification, all samples are designated as non-acid generating because all samples have an ANP/AGP ratio greater than 4.

Figure 3 can be used to make an assessment of the empirical rule of thumb for ARD potential based on paste pH and sulfide sulfur content. Samples in the upper left quadrant (sulfide sulfur <0.3 weight

percent [wt. %], paste pH >5.5) are considered unlikely to generate acid. All samples except GH5-6, 0-3' plot within this quadrant. Despite this sample's higher sulfide-sulfur content (1.31 wt. %), this sample is also considered non-acid generating due to its high ANP resulting in an ANP/AGP value greater than 4.

Figures 4 and 5 show sulfide-sulfur versus the total sulfur and sulfate-sulfur versus total sulfur, respectively. For all samples but one, sulfate is the dominant sulfur species.

Figure 6 shows that paste pH generally increases as ANP increases. A plot of paste pH versus ANP/AGP (Figure 7) shows the same narrow range of near-neutral to alkaline paste pH values and further illustrates no potential to generate acid (i.e., NPR >4).

Note that these criteria can only be used to identify the potential of a material to generate acid. Although ABA results may not be able to predict the likelihood of acid generation and rate at which acid generation occurs, these results show that the bulk of the material is so unlikely to generate acid that additional long-term testing is unlikely to change the conclusion.

#### 4.3.2 SPLP and Total Metals

Total metals and SPLP results are shown in Tables 2 and 3, respectively. Total metals results are similar to the 2004 investigation results, with some elevated concentrations for metals associated with the orebody (i.e., lead and zinc), and high calcium concentrations indicative of the predominantly limestone material.

All samples collected in 2006 were subjected to SPLP testing to determine whether metals and other constituents had the potential to leach from the stockpile. SPLP leachate pH values ranged from 6.34 to 8.61. Constituent concentrations in SPLP leachates did not exceed any groundwater or surface-water standards. Many metals were below detectable limits in all SPLP leachates (i.e., arsenic, cadmium, cobalt, copper, iron, nickel, lead, selenium, and zinc) indicating low metals mobility under the test conditions (i.e., circumneutral to slightly alkaline pH values).

## 5.0 SUMMARY AND CONCLUSIONS

The results of this supplemental investigation confirm the conclusions and recommendations of the SIR (Golder, 2005). Conclusions of the supplemental investigation are:

- Based on ABA results, the stockpile materials near the regraded surface are not acid generating and exhibit a high neutralization capacity.
- The stockpile materials are not indicated by SPLP to be a significant source of leachable metals. SPLP leachate concentrations did not exceed any Water Quality Control Commission groundwater or surface-water standard.

## 6.0 REFERENCES

- Chino Mines Company, Steffen, Robertson and Kirsten, 1997. *Administrative Order on Consent, Investigation Area Health and Safety Plan*. Prepared for Chino Mines Company, Hurley, New Mexico. January 1997.
- Daniel B. Stephens and Associates, 1997. *Shallow Groundwater Monitoring Wells at the Groundhog Site*. Prepared for Chino Mines Company, Hurley, New Mexico. October 17, 1997.
- Golder Associates, Inc. (Golder), 2004. *Interim Remedial Action, Groundhog No. 5 Stockpile, Site Investigation Work Plan, Hanover and Whitewater Creeks Investigation Unit*. Prepared for Chino Mines Company, Hurley, New Mexico. October 22, 2004.
- Golder, 2005. *Interim Remedial Action, Groundhog No. 5 Stockpile, Site Investigation Report, Hanover and Whitewater Creeks Investigation Unit*. Prepared for Chino Mines Company, Hurley, New Mexico. June 3, 2005.
- Price, W.A., 1997. *Draft, Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia*. Reclamation Section, Energy and Minerals Division, Ministry of Employment and Investment, Bag 5000, Smithers, BC. April 1997.

## TABLES

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**TABLE 1**  
**ACID-BASE ACCOUNTING RESULTS FOR TEST PITS SAMPLED DECEMBER 15, 2006**

073-92553-06

Location ID	Depth Interval	Paste pH <sup>a</sup>	ABA Results				Sulfur				Material Classification
			Net Neutralizing Potential	ANP/AGP	AGP	ANP	Unidentifiable	Sulfide	Sulfate	Total	
		s.u.	tCaCO <sub>3</sub> /kt		tCaCO <sub>3</sub> /kt	tCaCO <sub>3</sub> /kt	%	%	%	%	
GH5-4 0-3'	0-3'	7.86	654	>2181	<0.30	654	0.01	<0.01	0.44	0.45	Not Acid Generating
GH5-5 0-18"	0-18"	8.25	699	>2329	<0.30	699	<0.01	<0.01	<0.01	<0.01	Not Acid Generating
GH5-6 0-3'	0-3'	7.55	527	13.9	40.9	568	<0.01	1.31	0.71	2.02	Not Acid Generating
GH5-7 0-6"	0-6"	7.46	535	>1783	<0.30	535	<0.01	<0.01	0.82	0.82	Not Acid Generating
GH5-8 0-3'	0-3'	7.51	446	205	2.19	448	<0.01	0.07	0.44	0.51	Not Acid Generating
GH5-Dup	0-3'	7.59	439	109	4.06	443	<0.01	0.13	0.53	0.67	Not Acid Generating

Notes:

<sup>a</sup> Saturated Paste pH

GH5-DUP is a field duplicate of GH5-8, 0-3'

ABA = acid-base accounting

ANP = acid neutralizing potential

AGP = acid generating potential - calculated based on sulfide sulfur

s.u. = standard units

tCaCO<sub>3</sub>/kt = tons calcium carbonate per kiloton of sediment

< = concentration less than detection limit



TABLE 2  
TOTAL METALS RESULTS FOR TEST PITS SAMPLED DECEMBER 15, 2006

Location ID	Depth Interval	Al	As	Ca	Cd	Co	Cr	Cu	Fe	K	Mg	Mn	Mo	Na	Ni	Pb	Sb	Se	Zn
GH5-4	0-3'	5,610	17	282,000	7.8	3	30.6	3910	10,300	1,020	6,240	4,390	< 0.09	42.7	< 0.16	1,370	0.88	< 0.78	2,810
GH5-5	0-18"	4,360	10	299,000	< 0.06	2	16.3	17.3	5,820	1,690	10100	235	< 0.09	86.2	8.1	25.4	0.84	< 0.78	77.4
GH5-6	0-3'	4,850	25	249,000	28.1	3	33.3	233	22,400	1,140	3540	5,280	< 0.09	55.1	< 0.16	2,110	0.72	< 0.78	8,160
GH5-7	0-6"	6,910	10	223,000	12.2	4	33.8	126	16,000	1,450	5060	5,340	< 0.09	50.2	< 0.16	2,040	0.68	0.85	4,440
GH5-8	0-3'	8,200	9	192,000	4.4	4	33.7	93	14,500	1,640	6170	2,310	< 0.09	56.2	4.8	482	0.75	< 0.78	1,720
GH5-DUP <sup>a</sup>	0-3'	8,470	10	196,000	11.1	5	32.7	58.1	15,300	1,800	6390	2,220	< 0.09	58	4.5	605	0.63	< 0.78	2,740

Notes:  
All concentrations in milligrams per kilogram  
< = concentration not detected above the practical quantitation level  
a = GH5-DUP is a field duplicate of GH5-8, 0-3'

TABLE 3  
SPLP RESULTS FOR THE TEST PITS SAMPLED DECEMBER 15, 2006

Sample ID	Depth Interval	pH	Ca	K	Mg	Na	Al	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Zn	TDS	Cl	F	SO <sub>4</sub>	Alkalinity	Alk - Bicarbonate	Alk - Carbonate
		(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L as CaCO <sub>3</sub> )	(mg/L as CaCO <sub>3</sub> )
NM GW Standard for Human Health		NS	NS	NS	NS	NS	NS	0.1	0.01	NS	0.05	NS	NS	NS	NS	NS	0.05	NS	0.05	NS	NS	NS	1.6	NS	NS	NS	NS
Other NM GW Standard for Domestic Water Supply		6-9	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.0	1.0	0.2	NS	NS	NS	NS	NS	10.0	1,000	250	NS	600	NS	NS	NS
Other NM GW Standard for Irrigation Use		NS	NS	NS	NS	NS	5.0	NS	NS	0.05	NS	NS	NS	NS	1.0	0.2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
GH5-4	0-3'	6.74	19.2	1.37	0.554	2.28	0.011	<0.0036	<0.0005	<0.0002	0.0009	<0.0002	<0.017	0.003	0.011	<0.0027	<0.0031	<0.0027	<0.013	<0.0009	60	<0.2	0.12	31.6	22.2	22.21	0.00
GH5-5	0-18"	8.52	6.89	0.916	1.34	2.06	0.125	<0.0036	<0.0005	<0.0002	0.0006	<0.0002	<0.017	<0.0015	0.006	<0.0027	<0.0031	0.003	<0.013	<0.0009	20	<0.2	0.25	2.46	29.8	26.28	3.50
GH5-6	0-3'	8.61	6.65	0.977	1.23	1.20	0.150	<0.0036	<0.0005	<0.0002	0.0005	<0.0002	<0.017	<0.0015	0.004	<0.0027	<0.0031	<0.0027	<0.013	<0.0009	17	<0.2	0.26	1.91	29.1	24.57	4.56
GH5-7	0-6"	6.72	49.4	1.37	0.592	1.86	<0.0056	<0.0036	<0.0005	<0.0002	0.0014	<0.0002	<0.017	0.008	0.015	<0.0027	<0.0031	<0.0027	<0.013	<0.0009	178	0.340	<0.1	108	20.1	20.13	0.00
GH5-8	0-3'	6.96	53.3	1.80	1.98	2.71	0.016	<0.0036	<0.0005	<0.0002	0.0010	<0.0002	<0.017	0.022	0.014	<0.0027	<0.0031	0.0032	<0.013	<0.0009	195	0.260	0.13	117	21	21.02	0.00
GH5-Dup	0-3'	6.34	60.7	1.58	2.04	3.00	0.008	<0.0036	<0.0005	<0.0002	0.0011	<0.0002	<0.017	0.010	0.016	<0.0027	<0.0031	<0.0027	<0.013	<0.0009	221	0.500	0.10	137	15.7	15.70	< 1

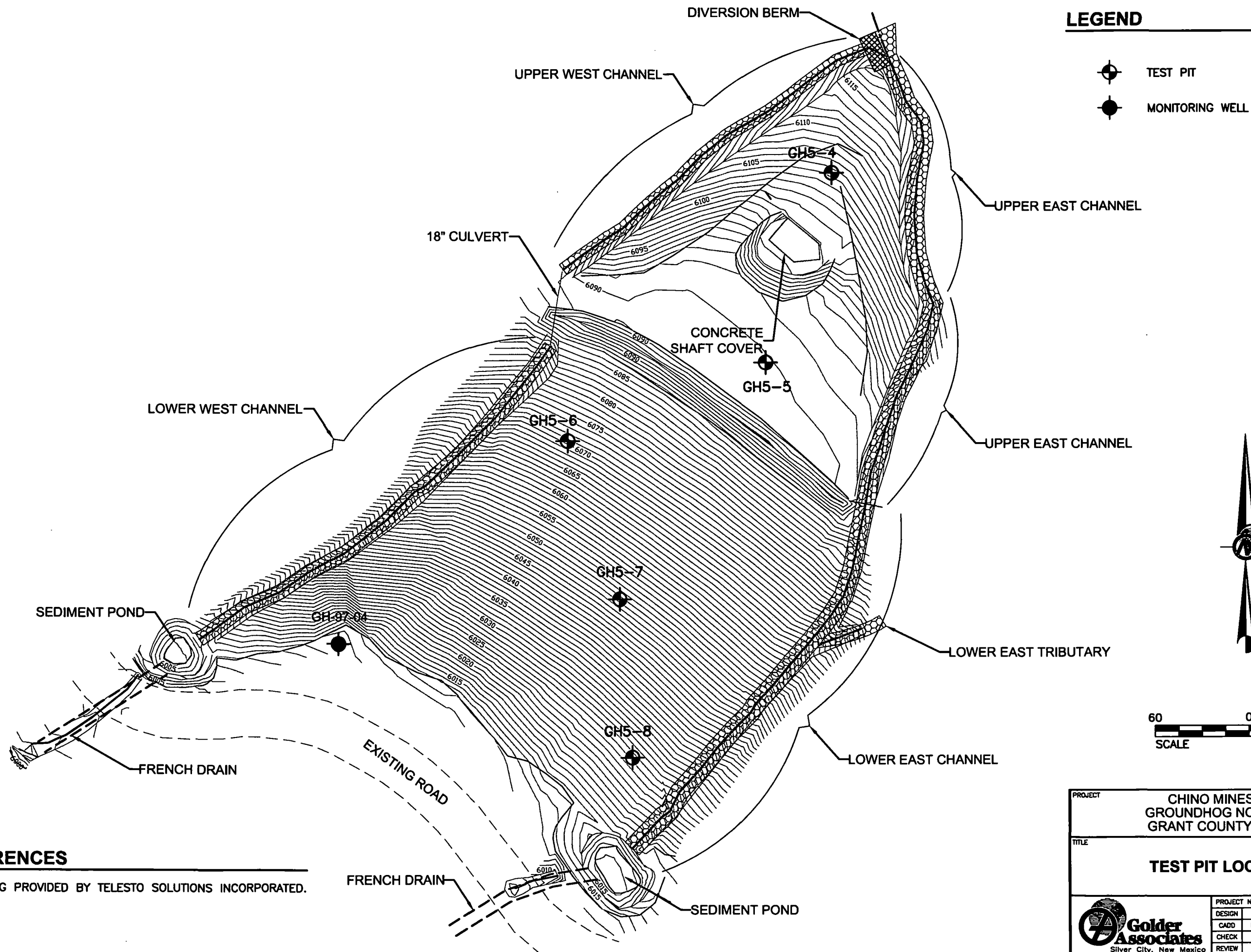
Notes:  
GH5-DUP is a field duplicate of GH5-8, 0-3'  
s.u. = standard units  
mg/L = milligrams per liter  
NS = no standard  
< = concentration not detected above the practical quantitative level  
TDS = total dissolved solids

## FIGURES

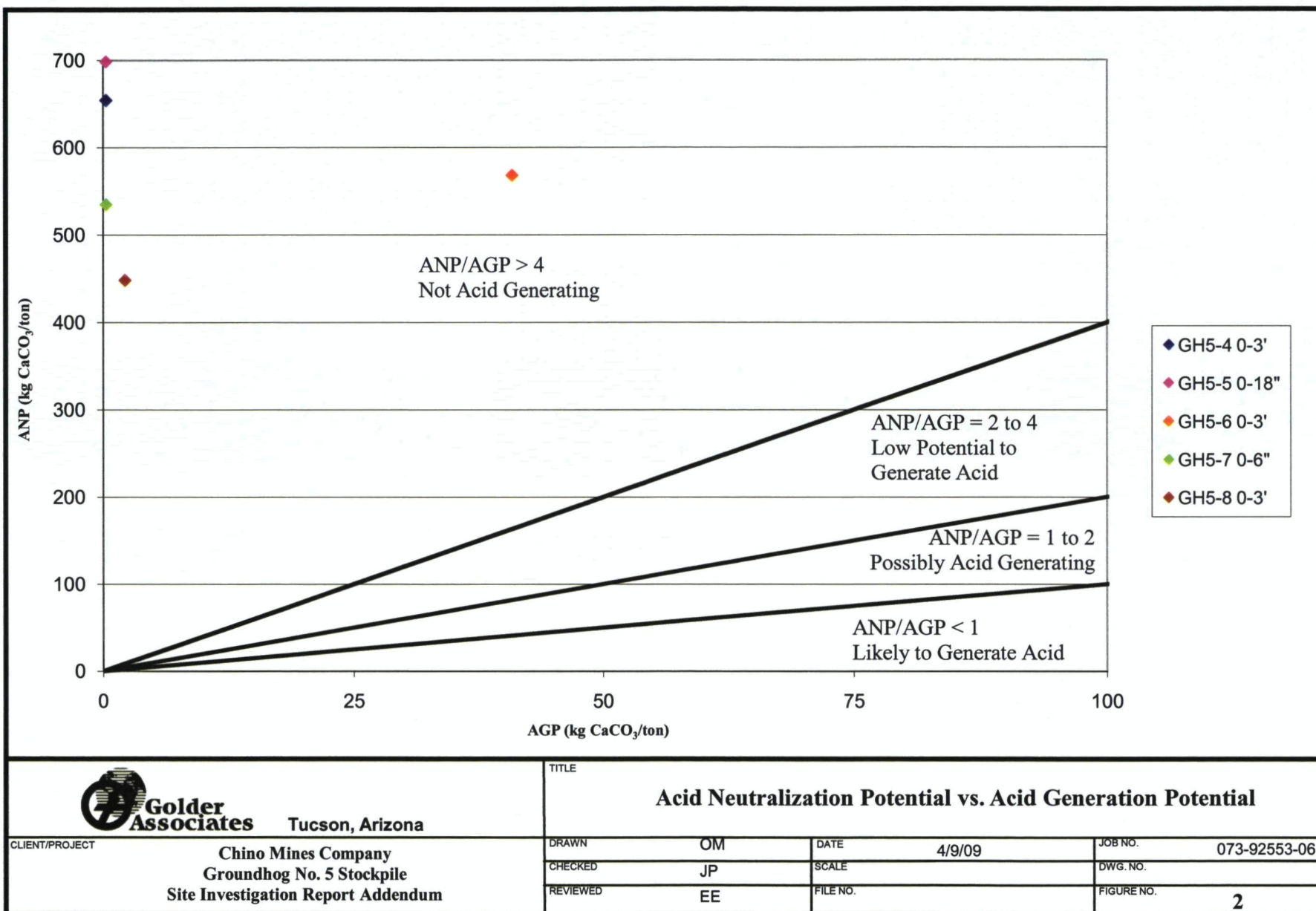
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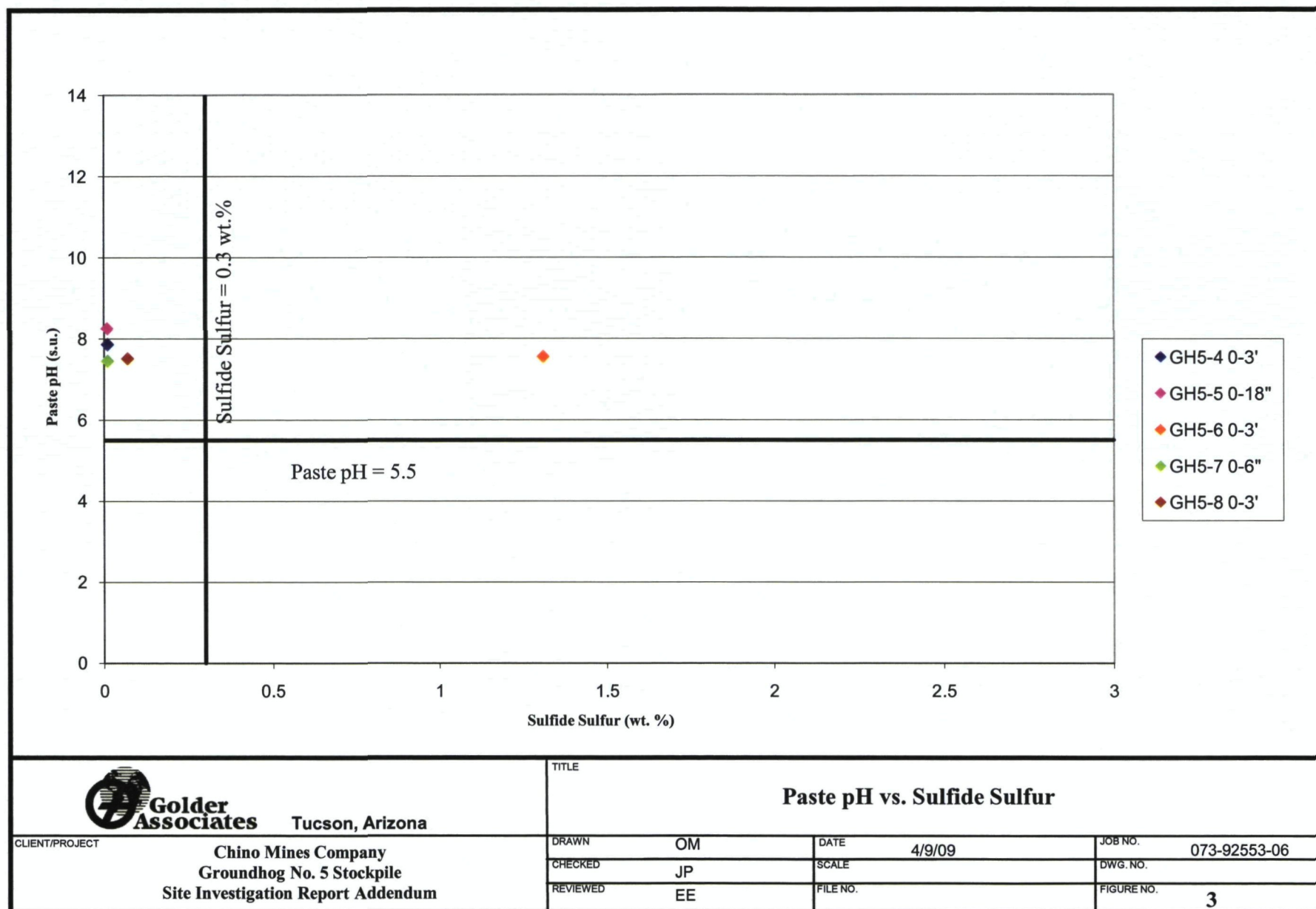
## REFERENCES

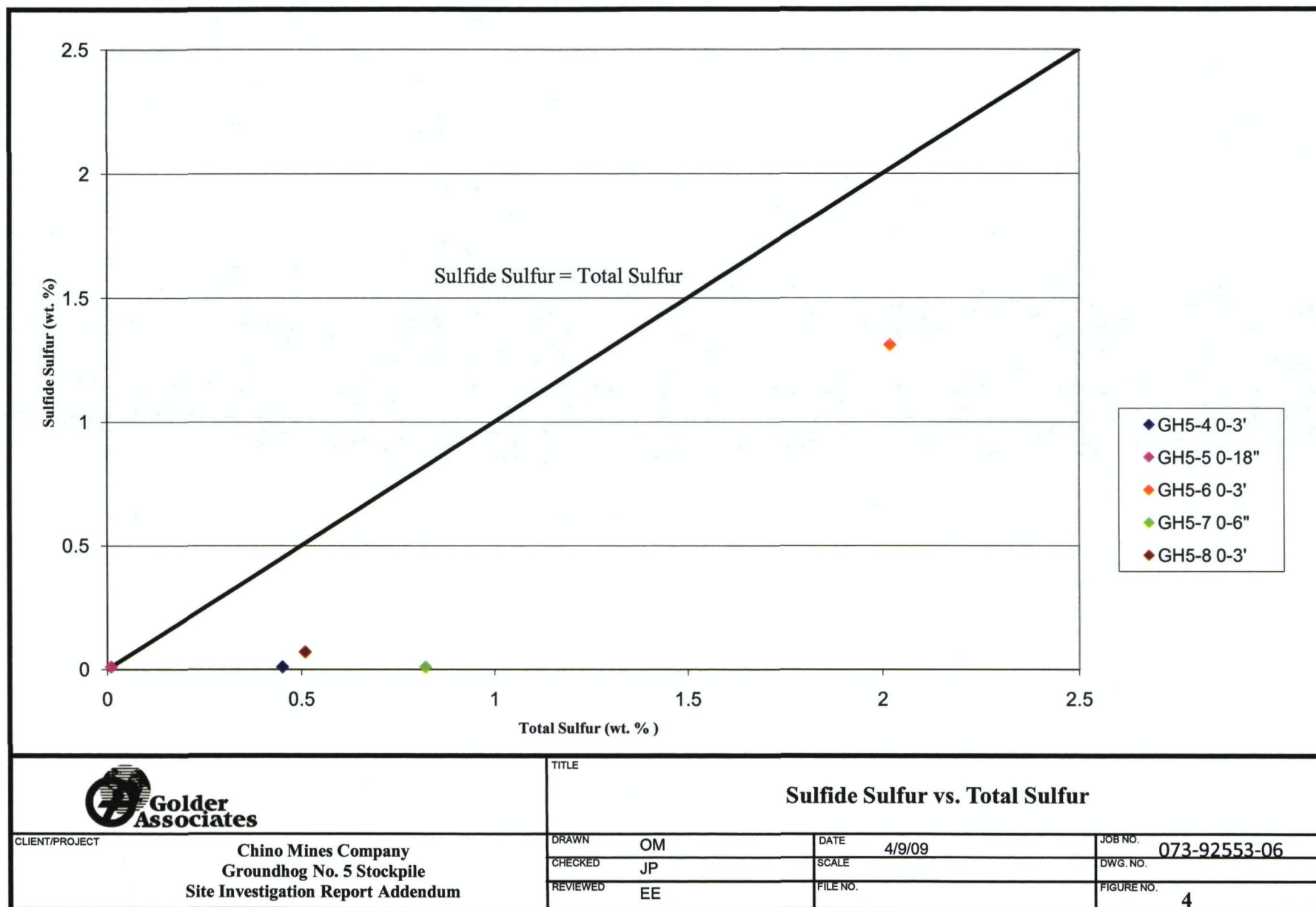
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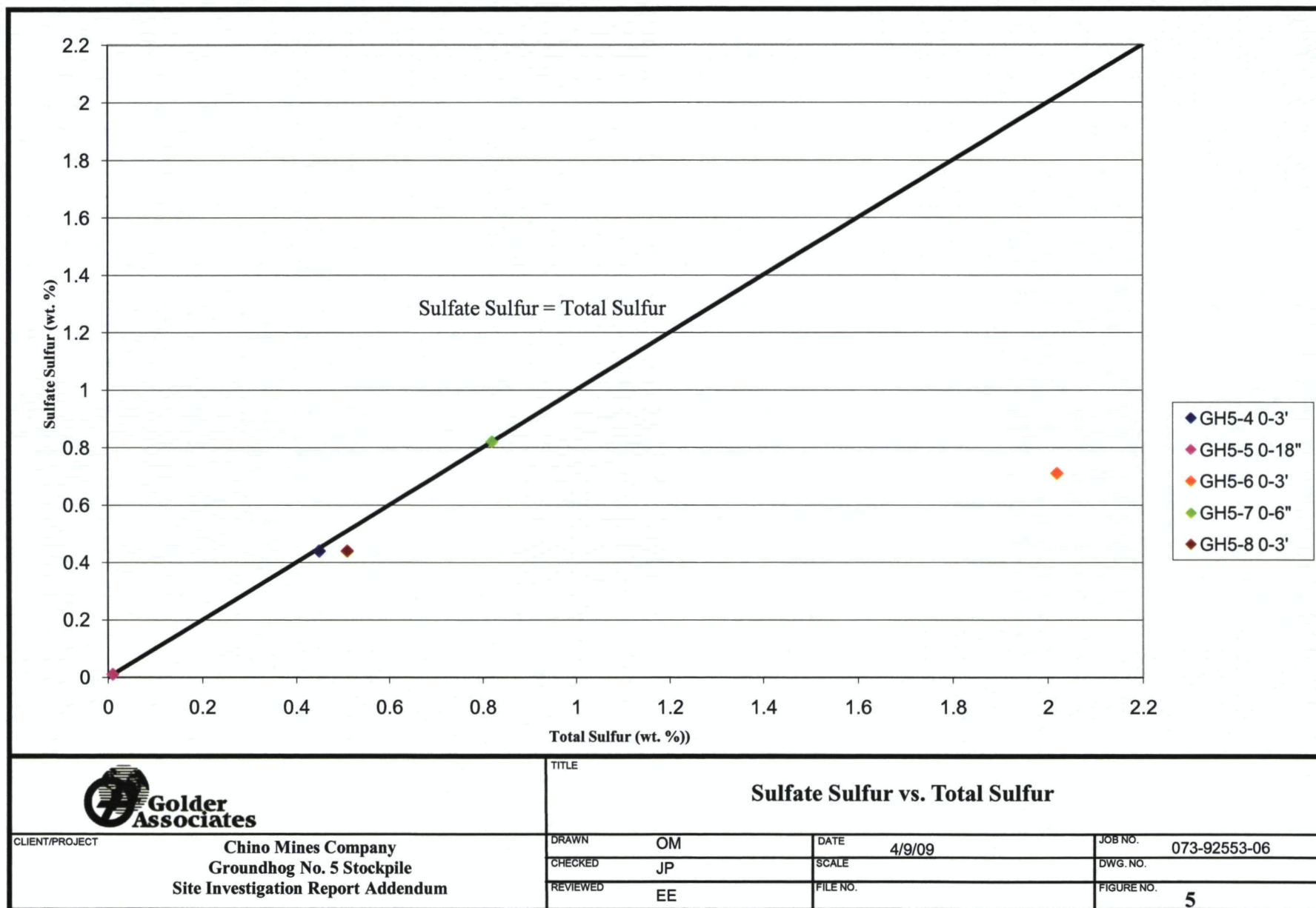
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TITLE		TEST PIT LOCATION MAP			
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		CADD	HNL	04/09/09	
		CHECK	JP	04/09/09	
		REVIEW	JP	04/09/09	
<b>FIGURE 1</b>					



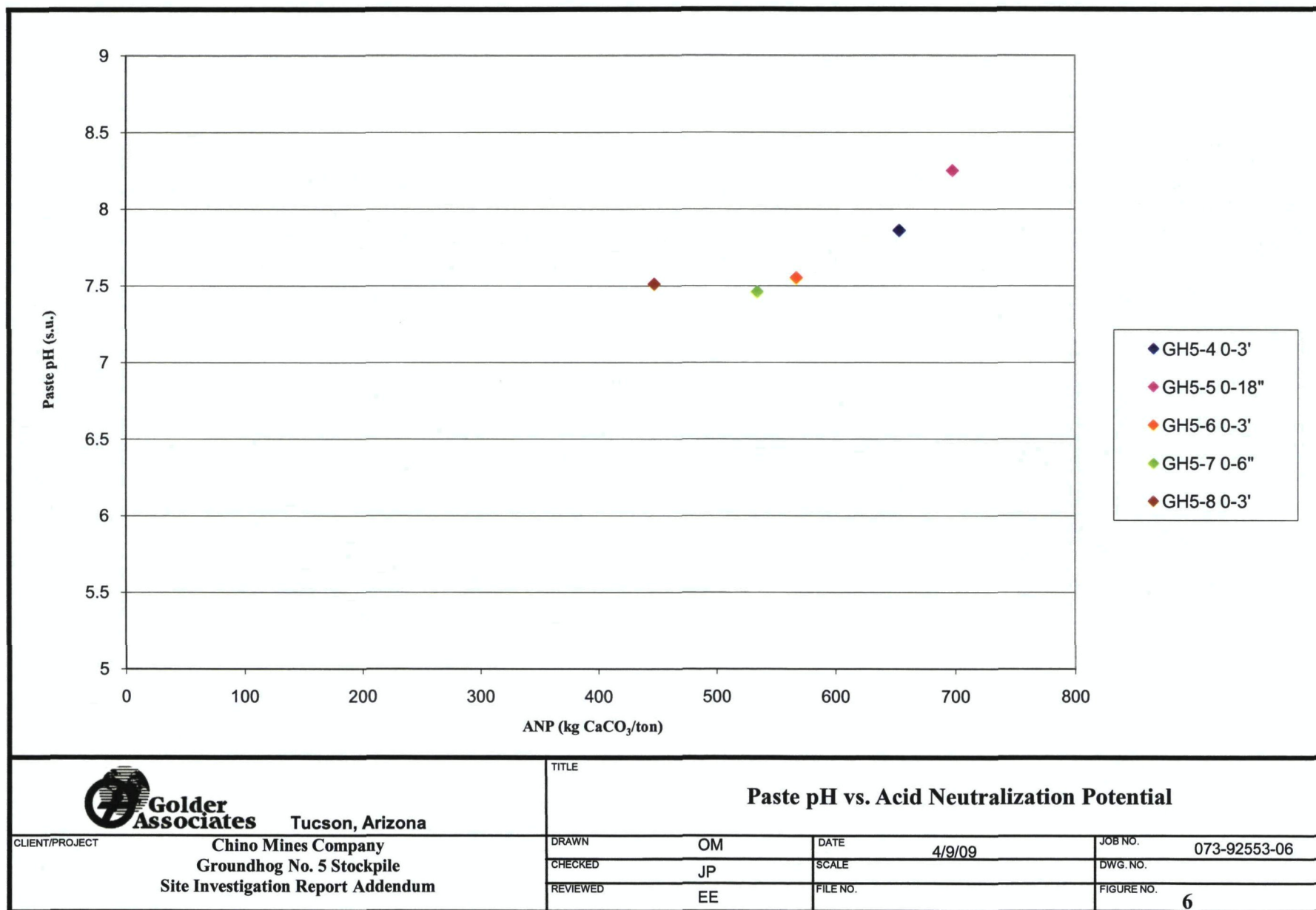


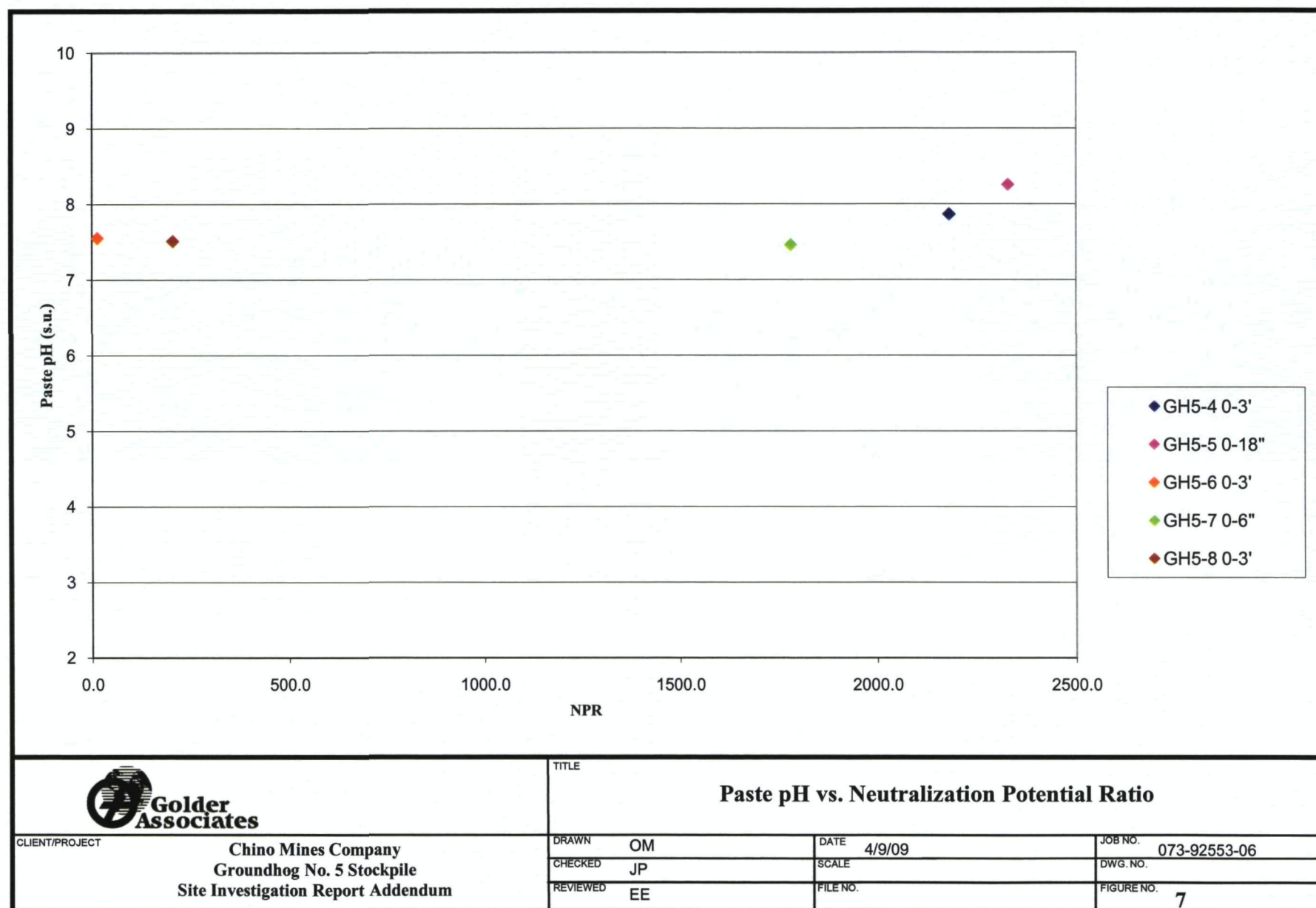












**APPENDIX A**

**REVIEW OF GEOCHEMICAL DATA FROM  
CHINO MINES COMPANY GROUNDHOG NO. 5 STOCKPILE**

## DRAFT TECHNICAL MEMORANDUM

**DATE:** April 17, 2006      **Telesto #** 200300

**TO:** Pam Pinson, Chino Mines Company

**FROM:** David Levy, Ph.D. and Phil Leonhardt, P.E.

**SUBJECT:** Review of Geochemical Data from the Chino Mines Company  
(Chino) Groundhog No. 5 Stockpile

### 1.0 INTRODUCTION

The Groundhog No. 5 Stockpile covers an area less than 2 acres and is located on the north side of Lucky Bill Canyon, near the confluence with Bayard Canyon. During November 2004, Golder Associates, Inc. (Golder) conducted an investigation to define the chemical nature and physical extent of the Groundhog No. 5 Stockpile, sufficient for Chino to evaluate interim remedial actions for the site (Golder, 2005). During the site investigation, a total of 10 stockpile samples were collected from three test pits, at depths ranging from ground surface to a depth of 4 feet. Representative samples were submitted for laboratory analysis which included acid/base accounting (ABA), paste pH, and constituent mobility using the Synthetic Precipitation Leach Procedure (SPLP). Water quality data were also evaluated from Monitoring Well GH-97-03, which was installed under the Administrative Order on Consent in 1997, and is located adjacent to the toe of the stockpile.

Based upon the results of geochemical testing, Golder (2005) concluded that there are no chemical or physical limitations which would restrict the use of Groundhog No. 5 Stockpile materials for reclamation substrate. In addition, water quality data for Monitoring Well GH-97-03 has shown that the concentrations of metals, sulfate, and TDS did not exceed standards of the New Mexico Water Quality Control Commission (NMWQCC) (Golder, 2000). Subsequently, a letter dated April 7, 2006 from Chris Eustice (NMED) to Robert Quintanar (Chino) states: *"From the ongoing investigations as part of the Remedial Investigation (RI), NMED has determined that the Groundhog site has in the past and has the potential in the future to contaminate ground water and surface water. Additionally, based on leach data results submitted as part of the Site Investigation Report, water quality standards set forth in 20.6.2.3103 NMAC will be exceeded unless a robust engineered long-term precipitation limiting cover or removal action is taken"*.

The objective of this memorandum is to provide additional technical review of geochemical data from the Groundhog No. 5 Stockpile which has been presented as part of the ongoing

# TECHNICAL MEMORANDUM

To: Pam Pinson

Date: April 17, 2006

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RI to evaluate: (1) Past impacts to ground water at Groundhog No. 5, and (2) potential future impacts to ground water at Groundhog No. 5.

## 2.0 SUMMARY OF RESULTS

- Past impacts to ground water were evaluated by reviewing the water quality data presented in Golder (2000) from Monitoring Well GH-97-03. Water quality results from Well GH-97-03 show that the concentrations of metals, sulfate, and total dissolved solids (TDS) did not exceed NMWQCC standards. These results were also later summarized in the Site Investigation Report (Golder, 2005).
- Potential future impacts to ground water were evaluated by reviewing the testing results from the ABA, paste pH, and the SPLP constituent mobility evaluations presented in Golder (2005). The ABA results show that all of the samples are classified as Non-Acid Generating and are not expected to generate acidity in the future. Paste pH values ranged from 7.25 to 8.39, indicating that the stockpile materials are composed primarily of limestone and do not contain acid. The results from SPLP testing showed that the concentrations of extractable aluminum, antimony, arsenic, cadmium, chloride, chromium, cobalt, copper, fluoride, iron, lead, manganese, molybdenum, nickel, selenium, sulfate, and zinc in the SPLP extracts did not exceed NMWQCC standards.

Only a single value for TDS (5,060 mg/L) reported for sample GH5-1 (0 to 2 ft) was greater than the NMWQCC standards, however this value is apparently invalid based on poor agreement with the calculated TDS of 48.7 mg/L. The accuracy of this water quality analysis was evaluated using cation-anion balance, which yielded an acceptable analytical accuracy of 5 percent (Golder, 2005). Therefore, the calculated TDS value of 48.7 mg/L, which does not exceed NMWQCC standards, should be substituted for the invalid reported measured TDS value of 5,060 mg/L for sample GH5-1.

## 3.0 CONCLUSIONS

Geochemical testing results from the Groundhog No. 5 Stockpile show that constituent concentrations in both ground water and in stockpile leachates do not exceed NMWQCC standards. Therefore, the geochemical data collected thus far as part of the RI indicate that there have been no past impacts to ground water, and that no future impacts to ground water are expected.

TECHNICAL MEMORANDUM

To: Pam Pinson

Date: April 17, 2006

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**4.0 REFERENCES**

Golder Associates, Inc. 2000. Phase 1 Remedial Investigation Report, Hanover and Whitewater Creeks Investigation Units. Prepared for Chino Mines Company (Hurley, NM). May 25.

Golder Associates, Inc. 2005. Administrative Order on Consent. Interim Remedial Action, Groundhog No. 5 Stockpile Site Investigation Report, Hanover and Whitewater Creeks Investigation Units. Prepared for Chino Mines Company (Hurley, NM) by Golder Associates, Inc. March 18.

**APPENDIX B**  
**TEST PIT LOGS**





## TEST PIT LOG:

GH5-4

**Client:** Chino  
**Project:** Groundhog No. 5 Stockpile  
**Project No.:** 953-1072-030  
**Latitude:** 32° 46' 11.7"  
**Longitude:** 108° 06' 19.6"

**Engineer:** Jen Pepe  
**Location:** Upper slope above crest  
**Contractor:** Hamilton  
**Operator:** Reuben Gomez  
**Equipment:** TB035 Mini-trackhoe

**Samples:** 0'-3' Composite

**Notes:** Begin 9:00  
Finish 9:20  
Dry hole

### Lithology:

Depth	USCS	Description
0 - 4'	GW-GM	Well graded GRAVEL with silt and sand - 5% oversized (3" - 12"), 50% angular to subangular gravel, 40% angular to subangular sand, 10% fines; grayish-brown, moist, non-plastic; strong reaction to HCl. Lithics: Predominantly limestone, few quartz monzonite. (STOCKPILE MATERIAL)







## TEST PIT LOG:

GH5-5

**Client:** Chino  
**Project:** Groundhog No. 5 Stockpile  
**Project No.:** 953-1072-030  
**Latitude:** 32° 46' 10.5"  
**Longitude:** 108° 06' 20.1"

**Engineer:** Jen Pepe  
**Date:** 12/15/2006  
**Location:** Just below "coffin lid" (closed shaft)  
**Contractor:** Hamilton  
**Operator:** Reuben Gomez  
**Equipment:** TB035 Mini-trackhoe

**Samples:** 0'-18" Composite

**Notes:** Begin 9:30  
Finish 10:00  
Dry hole

### Lithology:

Depth	USCS	Description
0 - 18"	GW	Well graded GRAVEL with sand - 10% angular-subangular oversized (3" to 9"), 55% angular gravel, 40% angular sand, 5% fines; dark gray, dry to moist, non-plastic; strong reaction to HCl. Moderately compacted/cemented. Lithics: Limestone. (STOCKPILE)
18" - 2.5'	SW	Well graded SAND with gravel - 15% angular oversized (>3"), 20% subangular gravel, 75% subangular sand, 5% fines; brown, moist, non-plastic, weak reaction with HCl. Lithics: Pink tuff, some quartz monzonite. (COLLUVIUM OF ORIGINAL SURFACE)







## TEST PIT LOG:

**GH5-6**

**Client:** Chino  
**Project:** Groundhog No. 5 Stockpile  
**Project No.:** 953-1072-030  
**Latitude:** 32° 46' 10.0"  
**Longitude:** 108° 06' 21.6"

**Engineer:** Jen Pepe  
**Date:** 12/15/2006  
**Location:** East side upper slope below crest  
**Contractor:** Hamilton  
**Operator:** Reuben Gomez  
**Equipment:** TB035 Mini-trackhoe

**Samples:** 0'-3' Composite

**Notes:** Begin 10:15  
Finish 10:45  
Dry hole

### Lithology:

Depth	USCS	Description
0 - 4'	GW	Well-graded GRAVEL with sand - 20% angular oversized (3" to 24"), 50% angular-subangular gravel, 45% angular to subangular sand, 5% fines; light brownish gray, moist upper 12", dry below 12", non-plastic, strong reaction to HCl. Lithics: Limestone (variably recrystallized), quartz-sericite-pyrite altered granodiorite (lenses), quartz monzonite. Below 2', primarily lenses of monzonite boulders.







## TEST PIT LOG:

**GH5-7**

**Client:** Chino  
**Project:** Groundhog No. 5 Stockpile  
**Project No.:** 953-1072-030  
**Latitude:** 32° 46' 09.0"  
**Longitude:** 108° 06' 21.2"

**Engineer:** Jen Pepe  
**Location:** Mid-slope below crest  
**Contractor:** Hamilton  
**Operator:** Reuben Gomez  
**Equipment:** TB035 Mini-trackhoe

**Date:** 12/15/2006

**Samples:** 0'-6" Composite

**Notes:** Begin 10:45  
Finish 11:15  
Dry hole

### Lithology:

Depth	USCS	Description
0 - 6"	GW	<i>Well graded GRAVEL with sand</i> - 30% angular oversized (>3"), 80% angular gravel, 15% angular sand, 5% fines; dark yellowish brown, dry, non-plastic, strong reaction to HCl. Lithics: Limestone with some quartz monzonite in sand fraction.
6" - 3'	GP	<i>Poorly graded GRAVEL</i> - 50% oversized (3" to 2"), matrix is 100% angular gravel (1" to 3"), gray, dry, non-plastic (no fines in matrix); weak reaction to HCl. Lithics: Recrystallized limestone.







## TEST PIT LOG:

GH5-8

**Client:** Chino  
**Project:** Groundhog No. 5 Stockpile  
**Project No.:** 953-1072-030  
**Latitude:** 32° 46' 08.0"  
**Longitude:** 108° 06' 21.1"

**Engineer:** Jen Pepe  
**Location:** Slope toe  
**Contractor:** Hamilton  
**Operator:** Reuben Gomez  
**Equipment:** TB035 Mini-trackhoe

**Date:** 12/15/2006

**Samples:** 0'-3' Composite  
0'-3' Composite Duplicate

**Notes:** Begin 11:15  
Finish 11:40  
Dry hole

### Lithology:

Depth	USCS	Description
0 - 4'	GM	Silty GRAVEL with sand - 10% angular oversized (3" to 6"), 55% angular-subangular gravel, 30% angular to subangular sand, 15% fines; pale brown, moist, low plasticity, strong reaction to HCl. Lithics: Limestone, quartz monzonite, minor quartz-sericite-pyrite altered granodiorite, isolated iron-stained monzonite cobbles. Slight increase in quartz monzonite below 2' depth.



**APPENDIX C**

**LABORATORY DATA SHEETS**

**SVL ANALYTICAL, INC.**

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines  
PROJECT: G12526-002  
CLIENT SAMPLE ID: EXTRACTION FLUID  
Sample Collected: 12/15/06  
Sample Receipt : 12/19/06  
Date of Report : 1/16/07

SVL JOB: 127106  
SAMPLE: 554832

Matrix: ESOIL  
Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	<1.0	mg CaCO <sub>3</sub> /L		2320B	12/29/06
CO <sub>3</sub> , CaCO <sub>3</sub>	<1.0	mg CaCO <sub>3</sub> /L		2320B	12/29/06
HCO <sub>3</sub> , CaCO <sub>3</sub>	<1.0	mg CaCO <sub>3</sub> /L		2320B	12/29/06
pH	5.15 @ 23°C			150.1	12/29/06
TDS	<10	mg/L Ext		160.1	12/28/06
Chloride	<0.20	mg/L Ext		300.0	1/07/07
Fluoride	<0.10	mg/L Ext		300.0	1/07/07
Sulfate, SO <sub>4</sub>	<0.30	mg/L Ext		300.0	1/07/07

Reviewed By: \_\_\_\_\_

Date 01/16/2007

1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

**SVL ANALYTICAL, INC.**

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127106

PROJECT: G12526-002

SAMPLE: 554833

CLIENT SAMPLE ID: GH5-4 0-3'

Sample Collected: 12/15/06 9:30

Sample Receipt : 12/19/06

Matrix: ESOIL

Date of Report : 1/16/07

Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	22.2	mg CaCO <sub>3</sub> /L		2320B	12/29/06
CO <sub>3</sub> , CaCO <sub>3</sub>	<1.0	mg CaCO <sub>3</sub> /L		2320B	12/29/06
HCO <sub>3</sub> , CaCO <sub>3</sub>	22.2	mg CaCO <sub>3</sub> /L		2320B	12/29/06
pH	6.74 @ 23°C			150.1	12/29/06
TDS	60	mg/L Ext		160.1	12/28/06
Chloride	<0.20	mg/L Ext		300.0	1/07/07
Fluoride	0.12	mg/L Ext		300.0	1/07/07
Sulfate, SO <sub>4</sub>	31.6	mg/L Ext		300.0	1/07/07

SAMPLE ID READS GH-5+4

Reviewed By: *Berily Gray* Date 01/16/2007

1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127106

PROJECT: G12526-002

SAMPLE: 554834

CLIENT SAMPLE ID: GH5-5 0-18"

Sample Collected: 12/15/06 10:00

Sample Receipt : 12/19/06

Date of Report : 1/16/07

Matrix: ESOIL  
Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	29.8	mg CaCO3/L		2320B	12/29/06
CO3, CaCO3	3.5	mg CaCO3/L		2320B	12/29/06
HCO3, CaCO3	26.3	mg CaCO3/L		2320B	12/29/06
pH	8.52 @ 23°C			150.1	12/29/06
TDS	20	mg/L Ext		160.1	12/28/06
Chloride	<0.20	mg/L Ext		300.0	1/07/07
Fluoride	0.25	mg/L Ext		300.0	1/07/07
Sulfate, SO4	2.46	mg/L Ext		300.0	1/07/07

Reviewed By: \_\_\_\_\_

Date 01/16/2007  
1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268



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Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines  
PROJECT: G12526-002  
CLIENT SAMPLE ID: GH5-6 0-3'  
Sample Collected: 12/15/06 10:30  
Sample Receipt : 12/19/06  
Date of Report : 1/16/07

SVL JOB: 127106  
SAMPLE: 554835

Matrix: ESOIL  
Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	29.1	mg CaCO3/L		2320B	12/29/06
CO3, CaCO3	4.6	mg CaCO3/L		2320B	12/29/06
HCO3, CaCO3	24.6	mg CaCO3/L		2320B	12/29/06
pH	8.61 @ 23°C			150.1	12/29/06
TDS	17	mg/L Ext		160.1	12/28/06
Chloride	<0.20	mg/L Ext		300.0	1/07/07
Fluoride	0.26	mg/L Ext		300.0	1/07/07
Sulfate, SO4	1.91	mg/L Ext		300.0	1/07/07

Reviewed By: \_\_\_\_\_

Date 01/16/2007  
1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127106

PROJECT: G12526-002

SAMPLE: 554836

CLIENT SAMPLE ID: GH5-7 0-6"

Sample Collected: 12/15/06 11:00

Sample Receipt : 12/19/06

Matrix: ESOIL

Date of Report : 1/16/07

Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	20.1	mg CaCO3/L		2320B	12/29/06
CO3, CaCO3	<1.0	mg CaCO3/L		2320B	12/29/06
HCO3, CaCO3	20.1	mg CaCO3/L		2320B	12/29/06
pH	6.72 @ 23°C			150.1	12/29/06
TDS	178	mg/L Ext		160.1	12/28/06
Chloride	0.34	mg/L Ext		300.0	1/07/07
Fluoride	<0.10	mg/L Ext		300.0	1/07/07
Sulfate, SO4	108	mg/L Ext	5	300.0	1/07/07

SAMPLE ID READS GH-5-7

Reviewed By: \_\_\_\_\_

Date 01/16/2007  
1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

**SVL ANALYTICAL, INC.**

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127106

PROJECT: G12526-002

SAMPLE: 554837

CLIENT SAMPLE ID: GH5-8 0-3'"

Sample Collected: 12/15/06 11:30

Sample Receipt : 12/19/06

Matrix: ESOIL

Date of Report : 1/16/07

Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	21.0	mg CaCO3/L		2320B	12/29/06
CO3, CaCO3	<1.0	mg CaCO3/L		2320B	12/29/06
HCO3, CaCO3	21.0	mg CaCO3/L		2320B	12/29/06
pH	6.96 @ 23°C			150.1	12/29/06
TDS	195	mg/L Ext		160.1	12/28/06
Chloride	0.26	mg/L Ext		300.0	1/07/07
Fluoride	0.13	mg/L Ext		300.0	1/07/07
Sulfate, SO4	117	mg/L Ext	5	300.0	1/07/07

Reviewed By: \_\_\_\_\_

Date 01/16/2007  
1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127106

PROJECT: G12526-002

SAMPLE: 554838

CLIENT SAMPLE ID: GH5-DUP

Sample Collected: 12/15/06 11:30

Sample Receipt : 12/19/06

Matrix: ESOIL

Date of Report : 1/16/07

Extraction: SPLP

Determination	Result	Units	Dilution	Method	Analyzed
ALKALINITY	15.7	mg CaCO3/L		2320B	12/29/06
CO3, CaCO3	<1.0	mg CaCO3/L		2320B	12/29/06
HCO3, CaCO3	15.7	mg CaCO3/L		2320B	12/29/06
pH	6.34 @ 24°C			150.1	12/29/06
TDS	221	mg/L Ext		160.1	12/28/06
Chloride	0.50	mg/L Ext		300.0	1/07/07
Fluoride	0.10	mg/L Ext		300.0	1/07/07
Sulfate, SO4	137	mg/L Ext	5	300.0	1/07/07

Reviewed By: \_\_\_\_\_

Date 01/16/2007  
1/16/07 14:31

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E554832

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554832

Level (low/med): LOW

Date Received: 12/19/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5.6	U		P
7440-36-0	Antimony	2.7	U		P
7440-38-2	Arsenic	3.6	U		P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium	7.4	B		P
7440-47-3	Chromium	0.20	U		P
7440-48-4	Cobalt	0.20	U		P
7440-50-8	Copper	0.20	U		P
7439-89-6	Iron	17.0	U		P
7439-92-1	Lead	3.1	U		P
7439-95-4	Magnesium	9.0	U		P
7439-96-5	Manganese	1.5	U		P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.7	U		P
7440-09-7	Potassium	38.0	U		P
7782-49-2	Selenium	13.0	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	31.0	U		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	0.90	U		P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	0.90	U		P

Color Before: COLORLESS  
Color After: COLORLESSClarity Before: CLEAR  
Clarity After: CLEARTexture: \_\_\_\_\_  
Artifacts: \_\_\_\_\_

Comments:

CLIENT ID: EXTRACTION FLUID

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E554833

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554833

Level (low/med): LOW

Date Received: 12/19/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11.1	B		P
7440-36-0	Antimony	2.7	U		P
7440-38-2	Arsenic	3.6	U		P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium	19200			P
7440-47-3	Chromium	0.88	B		P
7440-48-4	Cobalt	0.20	U		P
7440-50-8	Copper	0.20	U		P
7439-89-6	Iron	17.0	U		P
7439-92-1	Lead	3.1	U		P
7439-95-4	Magnesium	554			P
7439-96-5	Manganese	3.4	B		P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.7	U		P
7440-09-7	Potassium	1370			P
7782-49-2	Selenium	13.0	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	2280			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	0.90	U		P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	11.2			P

Color Before: COLORLESS

Clarity Before: CLEAR

Texture: \_\_\_\_\_

Color After: COLORLESS

Clarity After: CLEAR

Artifacts: \_\_\_\_\_

Comments:

CLIENT ID: GH5-4\_0-3'

FORM I - IN

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E554834

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554834

Level (low/med):

LOW

Date Received: 12/19/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	125	-		P
7440-36-0	Antimony	3.0	B		P
7440-38-2	Arsenic	3.6	U		P
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium	6890	-		P
7440-47-3	Chromium	0.62	B		P
7440-48-4	Cobalt	0.20	U		P
7440-50-8	Copper	0.20	U		P
7439-89-6	Iron	17.0	U		P
7439-92-1	Lead	3.1	U		P
7439-95-4	Magnesium	1340	-		P
7439-96-5	Manganese	1.5	U		P
7439-97-6	Mercury		-		NR
7440-02-0	Nickel	2.7	U		P
7440-09-7	Potassium	916	-		P
7782-49-2	Selenium	13.0	U		P
7440-22-4	Silver		-		NR
7440-23-5	Sodium	2060	-		P
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc	0.90	U		P
7440-74-8	Boron		-		NR
7439-98-7	Molybdenum	5.5	B		P
			-		
			-		
			-		
			-		
			-		
			-		
			-		
			-		
			-		

Color Before: COLORLESS  
Color After: COLORLESSClarity Before: CLEAR  
Clarity After: CLEARTexture: \_\_\_\_\_  
Artifacts: \_\_\_\_\_

Comments:

CLIENT\_ID: GH5-5\_0-18"

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E554835

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554835

Level (low/med): LOW

Date Received: 12/19/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	150	-		P
7440-36-0	Antimony	2.7	U		P
7440-38-2	Arsenic	3.6	U		P
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium	6650			P
7440-47-3	Chromium	0.49	B		P
7440-48-4	Cobalt	0.20	U		P
7440-50-8	Copper	0.20	U		P
7439-89-6	Iron	17.0	U		P
7439-92-1	Lead	3.1	U		P
7439-95-4	Magnesium	1230			P
7439-96-5	Manganese	1.5	U		P
7439-97-6	Mercury		-		NR
7440-02-0	Nickel	2.7	U		P
7440-09-7	Potassium	977			P
7782-49-2	Selenium	13.0	U		P
7440-22-4	Silver		-		NR
7440-23-5	Sodium	1200			P
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc	0.90	U		P
7440-74-8	Boron		-		NR
7439-98-7	Molybdenum	4.0	B		P

Color Before: COLORLESS

Clarity Before: CLEAR

Texture: \_\_\_\_\_

Color After: COLORLESS

Clarity After: CLEAR

Artifacts: \_\_\_\_\_

Comments:

CLIENT\_ID: GH5-6\_0-3'



## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E554836

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554836

Level (low/med): LOW

Date Received: 12/19/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5.6	U		P
7440-36-0	Antimony	2.7	U		P
7440-38-2	Arsenic	3.6	U		P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium	49400			P
7440-47-3	Chromium	1.4	B		P
7440-48-4	Cobalt	0.20	U		P
7440-50-8	Copper	0.20	U		P
7439-89-6	Iron	17.0	U		P
7439-92-1	Lead	3.1	U		P
7439-95-4	Magnesium	592			P
7439-96-5	Manganese	7.9			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.7	U		P
7440-09-7	Potassium	1370			P
7782-49-2	Selenium	13.0	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	1860			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	0.90	U		P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	15.1			P

Color Before: COLORLESS  
Color After: COLORLESSClarity Before: CLEAR  
Clarity After: CLEARTexture: \_\_\_\_\_  
Artifacts: \_\_\_\_\_

Comments:

CLIENT ID: GH5-7\_0-6"

CLIENT SAMPLE NO.

Lab Name: SVL ANALYTICAL INC.

Lab Code: SILVER

Case No:

**Contract:**

**SAS No:**

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554837

Level (low/med): LOW

Date Received: 12/19/06

% Solids:	0.0
-----------	-----

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR

**Texture:**

Color After: COLORLESS

Clarity After: CLEAR

**Artifacts:**

**Comments:**

CLIENT ID: GH5-8 0-3'''

## U.S. EPA - CLP

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

E554838

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127106

Matrix (soil/water): WATER

Lab Sample ID: E554838

Level (low/med): LOW

Date Received: 12/19/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8.0	B		P
7440-36-0	Antimony	2.7	U		P
7440-38-2	Arsenic	3.6	U		P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium	60700			P
7440-47-3	Chromium	1.1	B		P
7440-48-4	Cobalt	0.20	U		P
7440-50-8	Copper	0.20	U		P
7439-89-6	Iron	17.0	U		P
7439-92-1	Lead	3.1	U		P
7439-95-4	Magnesium	2040			P
7439-96-5	Manganese	9.6			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.7	U		P
7440-09-7	Potassium	1580			P
7782-49-2	Selenium	13.0	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	3000			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	0.90	U		P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	15.6			P

Color Before: COLORLESS

Clarity Before: CLEAR

Texture: \_\_\_\_\_

Color After: COLORLESS

Clarity After: CLEAR

Artifacts: \_\_\_\_\_

Comments:

CLIENT ID: GH5-DUP

FORM I - IN

## SVL ANALYTICAL, INC.

One Government Gulch • P.O. Box 929 • Kellogg, Idaho 83837-0929 • Phone: (208)784-1258 • Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127107

PROJECT: G12526-002

SAMPLE: 554842

CLIENT SAMPLE ID: GH5-4 0-3'

Sample Collected: 12/15/06 9:30

Sample Receipt : 12/19/06

Matrix: SOIL

Date of Report : 1/11/07 As Received Basis

Determination	Result	Units	Dilution	Method	Analyzed
ABP	654	TCaCO3/1000T		EPA600	1/09/07
Acid Generating	<0.3	TCaCO3/1000T		EPA600	1/09/07
Acid Neut. Pot.	654	TCaCO3/1000T		EPA600	1/09/07
pH Paste	7.86			ASA M9	1/09/07
Non-Ext Sulfur,S	0.01	%		LECO	1/09/07
Pyritic Sulfur,S	<0.01	%		LECO	1/09/07
Sulfate Sulfur,S	0.44	%		LECO	1/09/07
Total Sulfur, S	0.45	%		LECO	1/09/07

SAMPLE ID READS GH-5 +4

Tests:CHINO-GROUNDRHOG SOIL|ABA + Sulfur Forms|pH (PASTE)|

Reviewed By: Kirk GrayDate 01/18/2007  
1/11/07 10:25

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines  
PROJECT: G12526-002  
CLIENT SAMPLE ID: GH5-5 0-18"  
Sample Collected: 12/15/06 10:00  
Sample Receipt : 12/19/06  
Date of Report : 1/11/07 As Received Basis

SVL JOB: 127107  
SAMPLE: 554843

Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
ABP	698	TCaCO3/1000T		EPA600	1/09/07
Acid Generating	<0.3	TCaCO3/1000T		EPA600	1/09/07
Acid Neut. Pot.	698	TCaCO3/1000T		EPA600	1/09/07
pH Paste	8.25			ASA M9	1/09/07
Non-Ext Sulfur,S	<0.01	%		LECO	1/09/07
Pyritic Sulfur,S	<0.01	%		LECO	1/09/07
Sulfate Sulfur,S	<0.01	%		LECO	1/09/07
Total Sulfur, S	<0.01	%		LECO	1/09/07

Tests:CHINO-GROUNDHOG SOIL|ABA + Sulfur Forms|pH (PASTE)|

Reviewed By: *Trudy Gray*Date 1/11/2007  
1/11/07 10:25

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

**SVL ANALYTICAL, INC.**

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines  
PROJECT: G12526-002  
CLIENT SAMPLE ID: GH5-6 0-3'  
Sample Collected: 12/15/06 10:30  
Sample Receipt : 12/19/06  
Date of Report : 1/11/07 As Received Basis

SVL JOB: 127107  
SAMPLE: 554844

Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
ABP	527	TCaCO3/1000T		EPA600	1/09/07
Acid Generating	40.9	TCaCO3/1000T		EPA600	1/09/07
Acid Neut. Pot.	568	TCaCO3/1000T		EPA600	1/09/07
pH Paste	7.55			ASA M9	1/09/07
Non-Ext Sulfur,S	<0.01	%		LECO	1/09/07
Pyritic Sulfur,S	1.31	%		LECO	1/09/07
Sulfate Sulfur,S	0.71	%		LECO	1/09/07
Total Sulfur, S	2.02	%		LECO	1/09/07

Tests:CHINO-GROUNDHOG SOIL|ABA + Sulfur Forms|pH (PASTE)|

Reviewed By: \_\_\_\_\_

Date 01/11/2007  
1/11/07 10:25

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines

SVL JOB: 127107

PROJECT: G12526-002

SAMPLE: 554845

CLIENT SAMPLE ID: GH5-7 0-6"

Sample Collected: 12/15/06 11:00

Sample Receipt : 12/19/06

Date of Report : 1/11/07

As Received Basis

Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
ABP	535	TCaCO3/1000T		EPA600	1/09/07
Acid Generating	<0.3	TCaCO3/1000T		EPA600	1/09/07
Acid Neut. Pot.	535	TCaCO3/1000T		EPA600	1/09/07
pH Paste	7.46			ASA M9	1/09/07
Non-Ext Sulfur,S	<0.01	%		LECO	1/09/07
Pyritic Sulfur,S	<0.01	%		LECO	1/09/07
Sulfate Sulfur,S	0.82	%		LECO	1/09/07
Total Sulfur, S	0.82	%		LECO	1/09/07

SAMPLE ID READS GH-5 -7

Tests:CHINO-GROUNDHOG SOIL|ABA + Sulfur Forms|pH (PASTE)|

Reviewed By: \_\_\_\_\_

Date 01/18/2007

1/17/07 10:25

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

# SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines  
 PROJECT: G12526-002  
 CLIENT SAMPLE ID: GH5-8 0-3'"  
 Sample Collected: 12/15/06 11:30  
 Sample Receipt : 12/19/06  
 Date of Report : 1/11/07 As Received Basis

SVL JOB: 127107  
 SAMPLE: 554846  
 Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
ABP	446	TCaCO3/1000T		EPA600	1/09/07
Acid Generating	2.2	TCaCO3/1000T		EPA600	1/09/07
Acid Neut. Pot.	448	TCaCO3/1000T		EPA600	1/09/07
pH Paste	7.51			ASA M9	1/09/07
Non-Ext Sulfur,S	<0.01	%		LECO	1/09/07
Pyritic Sulfur,S	0.07	%		LECO	1/09/07
Sulfate Sulfur,S	0.44	%		LECO	1/09/07
Total Sulfur, S	0.51	%		LECO	1/09/07

Tests:CHINO-GROUNDHOG SOIL|ABA + Sulfur Forms|pH (PASTE)|

Reviewed By: *Tracy Gray* Date 01/18/2007  
 1/11/07 10:25

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268



**SVL ANALYTICAL, INC.**

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

Certificate: ID ID00019

CLIENT : Phelps Dodge - Chino Mines  
 PROJECT: G12526-002  
 CLIENT SAMPLE ID: GH5-DUP  
 Sample Collected: 12/15/06 11:30  
 Sample Receipt : 12/19/06  
 Date of Report : 1/11/07 As Received Basis

SVL JOB: 127107  
 SAMPLE: 554847

Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
ABP	439	TCaCO3/1000T		EPA600	1/09/07
Acid Generating	4.1	TCaCO3/1000T		EPA600	1/09/07
Acid Neut. Pot.	443	TCaCO3/1000T		EPA600	1/09/07
pH Paste	7.59			ASA M9	1/09/07
Non-Ext Sulfur,S	<0.01	%		LECO	1/09/07
Pyritic Sulfur,S	0.13	%		LECO	1/09/07
Sulfate Sulfur,S	0.53	%		LECO	1/09/07
Total Sulfur, S	0.67	%		LECO	1/09/07

Tests:CHINO-GROUNDHOG SOIL|ABA + Sulfur Forms|pH (PASTE)|

Reviewed By: *Shirley Leary* Date 01/18/2007  
 1/11/07 10:25

AZ: AZ0538 CA: CERT NO. 2080 CO: CERT NO. ID00019 ID: ID00019 MT: CERT. 0027 NV: CERT. ID19 WA: C1268

## INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO. 10

S554842

Lab Name: SVL ANALYTICAL INC. Contract: \_\_\_\_\_  
Lab Code: SILVER Case No: \_\_\_\_\_ SAS No: \_\_\_\_\_ SDG No: 127107  
Matrix (soil/water): SOIL Lab Sample ID: S554842  
Level (low/med): LOW Date Received: 12/19/06  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5610			P
7440-36-0	Antimony	0.88		N	P
7440-38-2	Arsenic	16.6			P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	7.8			P
7440-70-2	Calcium	282000			P
7440-47-3	Chromium	30.6			P
7440-48-4	Cobalt	2.6			P
7440-50-8	Copper	3910			P
7439-89-6	Iron	10300			P
7439-92-1	Lead	1370			P
7439-95-4	Magnesium	6240			P
7439-96-5	Manganese	4390			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.16	U		P
7440-09-7	Potassium	1020		N	P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	42.7			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	2810			P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	0.09	U		P

Color Before: GREY Clarity Before: \_\_\_\_\_ Texture: FINE  
Color After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

CLIENT ID: GH5-4\_0-3'

## INORGANIC ANALYSES DATA SHEET

S554843

Lab Name: SVL ANALYTICAL INC. Contract: \_\_\_\_\_  
Lab Code: SILVER Case No: \_\_\_\_\_ SAS No: \_\_\_\_\_ SDG No: 127107  
Matrix (soil/water): SOIL Lab Sample ID: S554843  
Level (low/med): LOW Date Received: 12/19/06  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4360			P
7440-36-0	Antimony	0.84		N	P
7440-38-2	Arsenic	9.6			P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	299000			P
7440-47-3	Chromium	16.3			P
7440-48-4	Cobalt	2.2			P
7440-50-8	Copper	17.3			P
7439-89-6	Iron	5820			P
7439-92-1	Lead	25.4			P
7439-95-4	Magnesium	10100			P
7439-96-5	Manganese	235			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	8.1			P
7440-09-7	Potassium	1690		N	P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	86.2			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	77.4			P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	0.09	U		P

Color Before: GREY Clarity Before: \_\_\_\_\_ Texture: FINE  
Color After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

CLIENT\_ID: GH5-5\_0-18"

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

S554844

Lab Name: SVL ANALYTICAL INC. Contract: \_\_\_\_\_  
Lab Code: SILVER Case No: \_\_\_\_\_ SAS No: \_\_\_\_\_ SDG No: 127107  
Matrix (soil/water): SOIL Lab Sample ID: S554844  
Level (low/med): LOW Date Received: 12/19/06  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4850			P
7440-36-0	Antimony	0.72		N	P
7440-38-2	Arsenic	24.8			P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	28.1			P
7440-70-2	Calcium	249000			P
7440-47-3	Chromium	33.3			P
7440-48-4	Cobalt	3.4			P
7440-50-8	Copper	233			P
7439-89-6	Iron	22400			P
7439-92-1	Lead	2110			P
7439-95-4	Magnesium	3540			P
7439-96-5	Manganese	5280			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.16	U		P
7440-09-7	Potassium	1140		N	P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	55.1			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	8160			P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	0.09	U		P

Color Before: GREY Clarity Before: \_\_\_\_\_ Texture: FINE  
Color After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

CLIENT\_ID: GH5-6\_0-3'

1  
INORGANIC ANALYSES DATA SHEET13  
CLIENT SAMPLE NO.

S554845

Lab Name: SVL ANALYTICAL INC. Contract: \_\_\_\_\_  
Lab Code: SILVER Case No: \_\_\_\_\_ SAS No: \_\_\_\_\_ SDG No: 127107  
Matrix (soil/water): SOIL Lab Sample ID: S554845  
Level (low/med): LOW Date Received: 12/19/06  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6910			P
7440-36-0	Antimony	0.68		N	P
7440-38-2	Arsenic	10			P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	12.2			P
7440-70-2	Calcium	223000			P
7440-47-3	Chromium	33.8			P
7440-48-4	Cobalt	3.7			P
7440-50-8	Copper	126			P
7439-89-6	Iron	16000			P
7439-92-1	Lead	2040			P
7439-95-4	Magnesium	5060			P
7439-96-5	Manganese	5340			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.16	U		P
7440-09-7	Potassium	1450		N	P
7782-49-2	Selenium	0.85			P
7440-22-4	Silver				NR
7440-23-5	Sodium	50.2			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	4440			P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	0.09	U		P

Color Before: GREY  
Color After: YELLOW

Clarity Before: \_\_\_\_\_  
Clarity After: \_\_\_\_\_

Texture: FINE  
Artifacts: \_\_\_\_\_

Comments:

CLIENT\_ID: GH5-7\_0-6"

1  
INORGANIC ANALYSES DATA SHEET14  
CLIENT SAMPLE NO.

S554846

Lab Name: SVL ANALYTICAL INC.

Contract: \_\_\_\_\_

Lab Code: SILVER

Case No: \_\_\_\_\_

SAS No: \_\_\_\_\_

SDG No: 127107

Matrix (soil/water): SOIL

Lab Sample ID: S554846

Level (low/med): LOW

Date Received: 12/19/06

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8200			P
7440-36-0	Antimony	0.75		N	P
7440-38-2	Arsenic	9.3			P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.4			P
7440-70-2	Calcium	192000			P
7440-47-3	Chromium	33.7			P
7440-48-4	Cobalt	4.4			P
7440-50-8	Copper	93.0			P
7439-89-6	Iron	14500			P
7439-92-1	Lead	482			P
7439-95-4	Magnesium	6170			P
7439-96-5	Manganese	2310			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	4.8			P
7440-09-7	Potassium	1640		N	P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver				NR
7440-23-5	Sodium	56.2			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1720			P
7440-74-8	Boron				NR
7439-98-7	Molybdenum	0.09	U		P

Color Before: GREY  
Color After: YELLOWClarity Before: \_\_\_\_\_  
Clarity After: \_\_\_\_\_Texture: FINE  
Artifacts: \_\_\_\_\_

Comments:

CLIENT ID: GH5-8\_0-3"

1  
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

S554847

Lab Name: SVL ANALYTICAL INC. Contract: \_\_\_\_\_  
Lab Code: SILVER Case No: \_\_\_\_\_ SAS No: \_\_\_\_\_ SDG No: 127107  
Matrix (soil/water): SOIL Lab Sample ID: S554847  
Level (low/med): LOW Date Received: 12/19/06  
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8470	-		P
7440-36-0	Antimony	0.63	-	N	P
7440-38-2	Arsenic	10.2	-		P
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium	11.1	-		P
7440-70-2	Calcium	196000	-		P
7440-47-3	Chromium	32.7	-		P
7440-48-4	Cobalt	4.7	-		P
7440-50-8	Copper	58.1	-		P
7439-89-6	Iron	15300	-		P
7439-92-1	Lead	605	-		P
7439-95-4	Magnesium	6390	-		P
7439-96-5	Manganese	2220	-		P
7439-97-6	Mercury		-		NR
7440-02-0	Nickel	4.5	-		P
7440-09-7	Potassium	1800	-	N	P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver		-		NR
7440-23-5	Sodium	58.0	-		P
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc	2740	-		P
7440-74-8	Boron		-		NR
7439-98-7	Molybdenum	0.09	U		P

Color Before: GREY Clarity Before: \_\_\_\_\_ Texture: FINE  
Color After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

CLIENT\_ID: GH5-DUP